VARIOUS.

Coloring and Finishing Brass Work.

To prevent the every-day rusting of brass goods, the trade has long resorted to means for protecting the surface from the action of the atmosphere, the first plan of which is to force a change to take place. Thus, if brass is left in damp sand, it acquires a beautiful brown color, which, when polished with a dry brush, remains permanent and requires no cleaning. It is also possible to impart a green and light coating of verdigris on the surface of the brass by means of dilute acids, allowed to dry spontaneously. The antique appearance thus given is very pleasing, and more or less permanent. But it is not always possible to wait for goods so long as such processes require, and hence more speedy methods became necessary, many of which had to be further protected by a coat of varnish. Before bronzing, however, all the requisite fitting is finished and the brass annealed, pickled in old or dilute nitric acid, till the scales can be removed from the surface, scoured with sand and water, and dried. Bronzing is then performed according to the color desired; for although the word means a brown color, being taken from the Italian *bronzino*, signifying burnt brown, yet in commercial language it includes all colors.

Browns of all shades are obtained by immersion in a solution of nitrate or the perchloride of iron, the strength of the solution determining the depth of the color. Violets are produced by dipping in a solution of chloride of antimony. Chocolate is obtained by burning on the surface of the brass moist red oxide of iron, and polished with a very small quantity of blacklead.

Olive green results from making the surface black by means of a solution of iron and arsenic in muriatic acid, polished with a blacklead brush, and coating it, when warm, with a lacquer composed of one part lac varnish, four of turmeric, and one of gamboge.

A steel-gray color is deposited on brass from a dilute boiling solution of chloride of arsenic; and a blue by careful treatment with strong hydrosulphate of soda.

Black is much used for optical brass work, and is obtained by coating the brass with a solution of platinum, or with chloride of gold mixed with nitrate of tin. The Japanese bronze their brass by boiling it in a solution of sulphate of copper, alum, and verdigris.

Success in the art of bronzing greatly depends on circumstances, such as the temperature of the alloy or of the solution, the proportions of the metals used in forming the alloy, and the quality of the materials. The moment at which to withdraw the goods, the drying of them, and a hundred little items of care and manipulation, require attention which experience alone can impart.

To avoid giving any artificial color to brass and yet to preserve it from being tarnished, it is usual to cover properly cleaned brass with a varnish called "lacquer". To prepare the brass for this, the goods, after being annealed, pickled, scoured, and washed, as already explained, are either dipped for an instant in pure commercial nitrous acid, washed in clean water, and dried in sawdust, or immersed in a mixture of one part of nitric acid with four of water, till a white curd covers the surface, at which moment the goods are withdrawn, washed in clear water, and dried in sawdust. In the first case the brass will be bright, in the latter, a dead flat, which is usually relieved by burnishing the prominent part. Then the goods are dipped for an instant in commercial nitric acid, and well washed in water containing argol (to preserve the color till lacquered), and dried in warm sawdust. So prepared, the goods are conveyed to the lacquer room, where they are heated on a plate and varnished.

The varnish used is one of spirit, consisting, in its simple form, of one ounce of shellac dissolved in one pint of alcohol. To this simple varnish are added such coloring substances as red sanders, dragon's blood, and annatto for imparting richness of color. To lower the tone of color, turmeric, gamboge, saffron, Cape aloes, and sandarac are used. The first group reddens, the second yellows the varnish, while a mixture of the two gives a pleasing orange.

A good pale lacquer consists of three parts of Cape aloes and one of turmeric to one of simple lac varnish. A full yellow contains four of turmeric and one of annatto to one of lac varnish. A gold lacquer, four of dragon's blood, and one of turmeric to one of lac varnish. A red, thirty-two parts of annatto and eight of dragon's blood to one of lac varnish.

Lacquers suffer a chemical change by heat and light, and must therefore be kept in a cool place and in dark vessels. The pans in use are either of glass or earthenware, and the brushes of camel's hair with no metal fittings. *Ironmonger's Review.*

New Photo Printing Process.

A new method by Herr Schahl is to coat a thin zinc plate with chromated gelatine, which he then exposes under a negative. The film is then rolled up with some reducing substance, which adheres only to the parts affected by the light. Tracing paper impregnated with iron is then pressed against the plate, and the iron being reduced at those places, an image is obtained, which is said to be much more delicate than one produced by ordinary photo-lithography. *Scientific American.*

Etching on Glass.

An article from the pen of William Gruene, of Berlin, on the process of etching drawings or letters on glass, in relief or opaque, has lately appeared in the Dresden *Glashutte,* which, says the *American Pottery Reporter,* we have translated and present to our friends, the glassmakers of America. As is well known, indestructible drawings on glass are made by a cold chemical process, by etching with diluted fluoric acid, first covering the places not to be eaten away with an acid-resisting material. The fluoric acid dissolves the glass without affecting the appearance of the parts protected. In consequence the drawing or design appears slightly opaque. The desired effect is then obtained by mechanical means. The elevated parts are ground rough, so that the alternate rough and smooth portions form the picture. The drawings must be etched deep, in order to avoid the deep lines in the mechanical work. It is necessary that all parts which are to become opaque must be covered with the coating, in order to avoid their destruction by the fluoric acid.

The new process described by Herr Gruene avoids all the difficulties surrounding the present process of etching, and enables the workman to stamp, mark, and ornament glass as if it were paper. The principle applied is as follows: The quality of the fluoric acid used is the same as in the old process, but the drawing is no longer made with a substance absolutely proof against the acid, but with another, protecting the glass only to a certain point of time, thus showing in the drawing the elevated marked opaque appearance. For such a covering almost all the lacs, oil varnishes, greasy printing dyes, etc., except the solutions of asphaltum, gutta percha, and caoutchouc, can be used. If applied thin, they yield to the concentrated fluoric acid, even after a few seconds, no matter how firmly dried they may have become. If the substances for covering are used simply for the above named purposes; they yield only a very feebly marked design, partly marked and partly blank; but if dusted after application with a finely pulverized powder of metal, copal, or any other substance capable of rendering longer resistance to the fluoric acid, the opaque drawing is obtained directly. This is the essential point of the invention.

For practical use the following advantages become apparent: 1. As the etching is rapid and not deep, no special protection of the surface by coating with acid-resisting material is necessary. 2. As only slightly resisting covering substances are necessary, the workman can use not only brushes, gravers, pens, and patterns for drawing purposes, but can also easily make transfers from all typographical, lithographical, copper, zinc, glass, and other prints. In like manner elastic stamps and forms can readily be used. As one can use, *ad libitum,* thicker or thinner coats, as well as apply coarser or finer powders for dusting, the opaque parts can be produced in any grain desired. In one and the same etching graded designs with proportional shades can also be produced.

The practical execution of this style of etching is carried out as follows: The article to be decorated receives the drawing by hand, stamp, or, as the case may be, by transfer. For the material choose an oily lac mixed with a little paint, so as to show on the glass. This done, dust in the powder. When dry, dip the part with the drawing into the fluoric acid, or put the latter on with a brush, and allow to remain a few seconds, or until the powder begins to come off. Then rinse with water. The greasy substance need not be removed, as the fluoric acid absorbs it. *Scientific American.*